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of
COMMERCIAL STANDARDS GROUP, BUREAU OF STANDARDS

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ADDRESS INQIRIES TO "COMMERCIAL STANDARDS"
ROOM 316 COMMERCE BUILDING,
WASHINGTON, D C.

"SIMPLIFIED PRACTICE HELPS INCREASE STABILITY OF EMPLOYMENT"

1. EDITORIAL "OUTLOOK FOR 1929"

Ray M. Hudson, Assistant Director, Commercial Standards.

That Simplified Practice will be applied on an increasing scale by industry and business in 1929 is forecast by the increasing number of requests to the Division of Simplified Practice for its cooperation; by the increasing number of inquiries reaching it regarding the application of Simplified Practice to wholesaling and retailing; and by the increased recognition and support accorded completed simplifications.

Many of the inquiries reflect a good understanding of Simplified Practice, a familiarity with its adoption and use in manufacturing, and a desire to test its values in the solution of distributor's problems. There also appears to be a growing recognition among buyers in general, and purchasing agents in particular, that it pays to specify simplified lines when buying. Likewise, among jobbers and wholesalers and to a lesser degree among retailers, there is a trend not only toward stocking lines already simplified, but also toward individual simplification wherein the distributor is analyzing his turnovers, line by line, and condensing his stocks to those items in most common demand.

Economies and benefits derived by those participating in the 100 simplifications effected with the aid of the division are beoming well-known, and industries burdened with excessive variety, slow turnover, and increasing costs of stock maintenance are looking into simplification as a means of relief.

The high percentage of adherence to, or conformity with, the existing simplifications; and the fact that the division has 60 others under way, twenty of which came to it within the past few months, also indicates that simplification will be found among the better management plans of a good many firms in 1929.

SIMPLIFIED PRACTICE

E W. Ely.

2. RESULTS AND BENEFITS

Summaries of statements of results and benefits gained from Simplified Practice by the acceptors of twenty different simplified Practice Recommendations ranging from Paving Bricks to Carbon Brushes are available in mimeographed form to any manufacturer, wholesaler, retailer or purchaser on request to the Division of Simplified Practice, 316 Commerce Building, Washington, D. C.

These summaries carry first hand statements of money savings and other benefits derived by acceptors of the Simplified Practice Recommendations reviewed. Believing that Bulletin readers will be interested to learn how Simplified Practice is working out, it is our intention to report in each Bulletin beginning with the January 15th, issue and continuing until further notice, "Results and Benefits" data as furnished by the acceptors of the various Simplified Practice Recommendations.

3. TRANSPORTATION ECONOMIES.

The growth of the practice of shipping goods on skid platforms thereby reducing the cost of handling, loading and unloading, has been handicapped by lack of interchangeability in the necessary equipment. The American Society of Mechanical Engineers has estimated that

$3,500,000,000, a year represents the direct cost of material handling in this country. Of this amount $700,000,000 is estimated as the cost of handling, loading, and unloading goods which can be shipped on skids. Total possible savings from the general adoption of national standards of dimensions as defined June 28, 1928, by a general conference of representative manufacturers and users held under the auspices of the Division of Simplified Practice of the United States Department of Commerce, are estimated at from $200,000,000 to $500,000,000 per year. While the principal savings will accrue to shippers, railroads are expected to benefit through faster loading and unloading of cars and heavier car loadings in certain commodities, and manufacturing plants through easier maintenance of a steady flow of material. Mimeographed releases on this simplified practice recommendation may be secured upon request from the Division of Simplified Practice. It is interesting to note in connection with this simplification that six articles dealing with various phases of the skid-handling of interplant shipment were presented at the annual meeting of the American Society of Mechanical Engineers held in New York City this month.

4. INTERNATIONAL STANDARDIZATION

In a radio talk given on November 17, Dr. Julius Klein, United States Bureau of Foreign and Domestic Commerce, directed attention to the increasing movements toward international standardization which promises to be an important element in future commercial concord. The successful matching of colors need no longer be a puzzle almost impossible to solution by feminine buyers, not to mention the hopelessness of the average male along this line, for, as Dr. Klein pointed out, the Textile Color Card Association now issues a variety of cards illustrating all the "modish" colors, in the actual materials, designating them not only by name but also by number. And each number indicates exactly the same color, whether in Saginaw or Singapore.

Progress towards international standardization is more advanced in engineering then in commodities, as illustrated in the three new international standards recently adopted by the International Electrochemical Commission: Standards for voltages, specifications for traction motors and dimensions for lamp sockets and bases. "Ball bearings" are now interchangeable internationally, there being 59 bearings which exhibit this world uniformity, international standards for raw cotton have been established; progress is being made in standardization of screw threads and bolt and nut proportions.

5. FOREIGN FIRMS STANDARDIZE RAYON

According to the October issue of "Le Nord Textile" an international Committee of representative European manufacturers of rayon has been formed for the purpose of standardization of rayon fabrics. The committee will attempt to obtain the adoption of uniform standards and the employment of uniform commercial practices in the different branches of the rayon industry.

6. SIMPLIFIED INVOICE LEAGUE

The Pennsylvania Railroad Company has been using the simplified invoice form for sometime past and does not accept invoices on any other form than the simplified one. Their realization is therefore 100 per cent.

The following resolution received unanimous approval. "Resolved, that the National Association of Stationers, Office Outfitters and Manufacturers, in annual meeting assembled hereby approves and endorses the simplified invoice form sponsored by the National Association of Purchasing Agents, under the auspices of the Division of Simplified Practice of the U. S. Department of Commerce."

The Materials Standardization Committee of the Pacific Coast Electrical Association reports that an effort will be made to have every purchasing agent place a rubber stamp on purchase orders requesting the use of the simplified invoice form.

The Canadian National Railways signified its preference for the simplified form almost immediately upon its adoption and has backed up its enthusiasm with practical work. They are continually writing their suppliers and have since August 1, sent out 400 direct letters throughout Canada. They are obtaining satisfying results. In 1925 the organization received 227,508 invoices; in 1926 they received 246,939; and in 1927 they received 250,699 invoices. It is expected that this year will show another big increase. Approximately 60 per cent of these are coming in on the simplified form.

The purchasing Agents Association of Tulsa, Oklahoma, heads the list of the Simplified Invoice League, in number of reports sent in thus far. The tabulated report is appended to this issue of the Bulletin. Our intention is to publish these reports in each issue of the Commercial Standards Group Monthly News Bulletin. We invite all firms to review their incoming invoices over a period of ten to fifteen days and then inform us as to the number which conform in all respects to the simplified invoice form. Invoices which only partly conform to this standard should not be counted.

## 7. PROFITS FROM STOCK SIMPLIFICATION

Under this heading the first of a series of articles on "MODERN METHODS IN RETAILING" by H. R. Doering, Assistant Professor of Business Administration, University of Wisconsin, appeared in a recent issue of the Wisconsin Retail Bulletin. In it he discusses the advantages of simplification, certain objections that retailers sometimes offer against it, and various examples of it in both independent and chain stores of different types. Professor Doering cites a chain of drug stores each of which stooked all of the 22,000 items carred in the central warehouse. After adopting simplification, the largest variety carried by any store in this chain was 13,000 items. Stock simplification in this organization resulted in reducing its inventory, speeding up its stock-turn and decreasing the number of persons employed. He also shows how simplification works out in the shoe field A store which cut down its stock of women's shoes from 460 styles to 220 increased its net sales from $550,000 to $595,000. Expenses were reduced from 12.7 per cent of the sales to 9.6 per cent while net profits were increased from 1.4 per cent of sales to 6.5 per cent.

## 8. NEW ENGLAND SIMPLIFICATION

Last month we made a review of the second report in the series on applying research to production entitled, "Standardization and Simplification" by the Research Committee of the New England Council. This report shows how simplification has been applied to the products of various New England manufacturers. The report continues:

"A manufacturer of machinery for the production of steel products simplified roll housings from 50 to 24 sizes, pinion housos from 30 to 2. and sections of angle iron from 74 to 11. One firearms company reduced their line from 18 to 8 models: another reduced their line from 354 to 100. A cotton and woolen manufacturing company which formerly used 160 yarns, varying in color, material or count, now uses, in one mill, one count of filling and warp, five different warps, all from the same count of yarn. In another mill where four counts of filling were formerly used, but one is now used with one count of warp. A shoe concern which in 1920 manufactured 2500 styles of shoes now manufactures only 100 styles. A paper manufacturer has found that hand to mouth buying is reducing the time allowed for delivery of orders, and making necessary a larger stock on hand for immediate shipment. His line consists of 53 grades of paper, approximately 12 colors to each grade, four or five weights and

various finishes. To facilitate the keeping of an adequate inventory, he is endeavoring to reduce the number of grades and discourage the demand for special watermarks.

9. URGES STANDARD ENVELOPES

The Post Office Department has renewed its campaign to discourage the use of small and irregular greeting cards and envelopes in the mails. The Department urges the use of standardized sizes of envelopes, since the postal service is hampered by unusual shapes in cards and envelopes.

10. GROUP ETHICS

According to Edgar L. Heermance in "Forbes." group ethics means better business. He says that with no special groups in the business world through which standards of practice could develop, 19th century competitors looked upon one another as scoundrels and liars, and moral anarchy reigned supreme. But at the close of the pioneer era, men in the same line of trade begain to organize for mutual protection and the promotion of certain common interests. The trade association originated and became the most important factor in the improvement of business ethics, advancing better methods and developing a spirit of good sportsmanship. Wherever there is friction or waste of money or effort, it is likely to be a sign of unadjusted relations. Sometimes the individual business man or corporation can make the necessary adjustment themselves. More often the industry must act as a whole, achieving unanimity of ethical sentiment, legislation capable of social control, and adequate enforcement. Ethics is still in the making, but the voluntary regulation of business practice is one of the striking features of our era."

Simplified Practice is based on voluntary cooperation and exemplifies self-government in business. (Ed. Note.)

11. STATISTICAL PROCEDURE

The need for standardization of statistical procedure of trade associations is outlined in the "Statistical Work of Trade Associations" by Thomas W. Howard, Assistant Manager, Department of Manufacture, Chamber of Commerce of the United States, as published in The Annals of the American Academy of Political and Social Science, Philadelphia. Mr. Howard states that the American Engineering Standards Committee has requested the American Society of Mechanical Engineers to sponsor the movement for standardization of statistical procedure. A study committee has been appointed by this Society and it has enlisted 28 trade organizations in the work. Work among sub-committees of this study committee has begun and tentative definitions have been prepared by the Sub-Committee on Terminology of the following: Inquiries and projects; new orders; cancellations; net new orders; shipments; transshipments; stocks; and production.

12. FIRE HOSE COUPLINGS

In a previous issue of the Monthly News Bulletin mention was made of the great fire in Baltimore many years ago. At that time the fire-apparatus from Washington, D. C., went over to the sister city to aid in the fight. Due to lack of standardized couplings, the two departments could not function as one organization. A little while back Washington had a big fire and the Baltimore fire companies came to her aid. Due to the progress made in simplification and standardization, the two departments hooked up as one.

Now Mechanical Engineering comes forward with a story about the great advantages derived from the use of nationally standardized fire-fighting euipment. Their observations were made from the fire at Fall River, Mass., last February. Twenty-nine oompanies from eighteen cities, through standardized equipment, were able to handle the situation.

13. PROGRESS OF SIMPLIFICATION PROJECTS

Photographic Paper. The summary report of the general oonference on photographic paper, which was held in New York on October 23rd, was sent to manufacturers, distributors and users, for acceptance this month.

Tags. The report of the meeting of the tag manufacturers held in Washington on October 25th, 1928 has been mailed to important user groups for their comment, and suggestions concerning the tentative set-up of the simplified schedule for shipping tags. A general conference to consider this program will be held in the near future, the time and place to be announced later.

Dental Hypodermic Needles. Material is being collected in connection with a simplification program for dental hypodermic needles. The simplified practice committee of manufacturers has determined that an opportunity for production in variety exists, and with the help of the Division of Simplified Practice will draft a tentative program for the consideration of all interests.

Dental Lathes. At the request of the Chairman of the Simplified Practice Committee of the American Dental Trade Association, an inquiry has been sent to manufacturers of grinding wheels for dental lathes for an expression of their opinion in regard to the opportunity for simplification of this commodity.

Roofing Ternes. The standing committee for Simplified Practice Recommendation No. 30, Roofing Ternes, has reaffirmed the existing schedule, without change, for another year. A survey conducted prior to the revision meeting indicated the degree of adherence to be 100 per cent to the program.

Rotary Cut Lumber. The standing committee for Simplified Practice Recommendation No. 59, Rotary Cut Lumber Stock for Wirebound Boxes, has reaffirmed the existing Schedule without change, for another year.

Skid Platforms. A sufficient number of signed acceptances having been received from manufacturers, distributors and users of skid platforms, the Division of Simplified Practice announces that the simplified practioe recommendation oovering this commodity is now in effect.

Eaves Trough and Conductor Pipe. The standing committee for Simplified Practice Recommendation No. 29, Eaves Trough and Conductor Pipe, has reaffirmed the existing schedule, without change. for another year. A survey conducted prior to the revision meeting indicated the degree of adherence to be approximately 94 per cent.

Pocket Knives. A general conference of all interests held on November 13, under the auspices of the Division of Simplified Practice, approved a recommendation on the simplification of pocket knives. A reduction in variety of from approximately 1200 to 500 was effected.

Indiana Hotel Association. A representative of the Division of Simplified Practice addressed the annual convention of the Indiana Hotel Association, at Indianapolis on December 1. He outlined what had been accomplished in other industries through the application of simplified

practice and urged the members to make this movement part of their program for the coming year.

Steel Bathroom Medicine Chests. A survey of sizes of steel bathroom medicine chests manufactured has been completed and it is intended to submit results of this survey to the committee of manufacturers appointed on November 1.

Glass Containers for Preserves, Jellies, and Apple Butter. Acceptances of the Simplified Practice Recommendation for preserve jars and jelly glasses are being returned at a very satisfactory rate. It would appear from the acceptances already received that this recommendation covering glass container sizes based on the avoirdupois weight of the food content will have the support of a large majority of manufacturers, distributors and users.

Beverage Bottles. The joint simplified practice committee authorized at the preliminary conference held on August 11, 1928, is now preparing a survey questionnaire to ascertain the percentage of production on the various types of beverage bottles used. From the data obtained the committee will draft a tentative recommendation for the consideration of the industry, covering heights, diameters and weight of glass for beverage bottles.

Glass Containers for Drug and Pharmaceutical Industries. The first meeting of the joint Simplified Practice Committee was held at the Department of Commerce on December 13, at which time a permanent chairman was selected and the scope of the activities of the committee was discussed

Hospital Plumbing Fixtures. A preliminary conference of the members of the Simplified Practice Committee on hospital plumbing fixtures will be held at the Department of Commerce on Monday, December 17, 1928, at which time the tentative recommendation covering types and dimensions will be discussed before submitting the recommendation to the hospital authorities for review and comment

Cooperage. In connection with the recent semi-annual convention of the Associated Cooperage Industries of America, a tentative list of sizes was worked out by the Committee on Standardization of Tight Cooperage, which is to be submitted to the members of the Association for approval or criticism. Sizes of tight kegs and barrels recommended for adoption were 5, 10, 15, 30, 45, 50, 57 gallons respectively, sizes 20 and 25 gallons being eliminated. Specifications also were prepared covering length and thickness of heading and diameter of bilge. The final tentative recommendations which have been worked out in the light of suggestions received, will be used as a basis for a general conference to be held next Spring under the auspices of the Division of Simplified Practice.

## COMMERCIAL STANDARDS

I. J. Fairchild.

### 14. COMMERCIAL STANDARDS PROGRESS

A Simplified line made according to a commercial standard for grade and quality, certified and labeled accordingly, backed by national advertising. represents a maximum of practicable protection to the consumer and a reliable source of profit and good will to the manufacturer and distributor.

Clinical Thermometers. The printed pamphlet entitled "Clinical Thermometers" Commercial Standard CS1-28, was released for distribution on November 22. Copies of this pamphlet are available on request to those who may be interested. This illustrates how one industry is

cooperating to safeguard the public by setting up rigid standards as a basis for daily trade and by certifying that each individual thermometer will meet all the requirements and tests of this commercial standard. The industry hopes by this means to set up a single rigid specification which can be accepted by all states and municipalities which now issue regulations regarding the sale of clinical thermometers, and, if possible to remove the necessity for any further spread of State regulations designed to control the sale of this important instrument. It is also expected that the marketing of clinical thermometers accompanied by certificates guaranteeing conformity to the commercial standard, will enable the consumer to purchase with considerably greater confidence and assurance, and will remove the necessity for laboratory tests to check up on small deliveries.

Surgical Gauze. The general conference on Surgical Gauze held at the Drug and Chemical Club, New York, November 16, 1928, unanimously endorsed the Proposed Commercial Standard with a few more or less Minor Modifications. Copies of the recommended Commercial Standard have been distributed for written acceptance. The standard sets up a minimum number of yards per pound for each of the various constructions, or in other words, minimum weight of cotton per yard and sets rigid limitations on amount of loading permitted, absorptive qualities, etc.

Template Hardware. As a result of several years of cooperative effort, more or less complete standards for template butts and cylinder locks for application to hollow metal doors, have been adopted by manufacturers of builders hardware and the producers of hollow metal doors. A joint conference representing the two groups held on November 15, voted to establish these recommendations as a Commercial Standard. It is believed the standard will materially reduce delays incident to deliveries of hollow metal doors and builders hardware on new building contracts.

Brass Pipe Nipples. A general conference is planned for 10:00 A.M., Friday, December 14, at the William Penn Hotel, Pittsburgh, Pennsylvania, to consider the establishment of a commercial Standard for Brass Pipe Nipples. All those interested in the production, distribution or consumption of this commodity have been invited to attend.

Furnace and Fuel Oils. Agreeable to a recent request from the American Oil Burner Association, Inc., arrangements are being made for a general conference early in January, to consider the establishment of a Commercial Standard for three grades of furnace oils and three grades of fuel oils for use in domestic and industrial oil burning equipment. The principal purpose of this standard is to enable the consumer to obtain the proper grade of oil for which his oil burning equipment is designed, and to encourage the sale of these oils on the basis of flash point, viscosity, distillation range and other valuable criteria rather than the gravity basis commonly used and now conceded to be more or less irrelevant.

Regain in Mercerized Cotton Yarns. Pursuant to a recent request from the National Association of Hosiery and Underwear Manufacturers, arrangements are being made for a general conference at 10:00 A.M., Tuesday, January 15, 1929, in Room 704, Commerce Building, Washington, D. C., to consider the establishment of a Commercial Standard for Moisture Content and Regain of Mercerized Cotton Yarns. The central purpose of this standard is to set up a uniform moisture content and regain as a basis for marketing mercerized yarns, to avoid controversies over weights of this commodity between buyer and seller.

Scottish Firm Distributes Commercial Standards. J. and R. Howie, Limited, of Hurlford, Kilmarnock, Scotland, indicate their interest in the Commercial Standard for Porcelain Plumbing Fixtures, by requesting fifty copies for distribution among members of the industry in Great Britain. Quoting their letter of October 26. "The Movement which you are organizing for the manufacturers of the United States would be of so great an advantage to the industry here if studied and adopted that we should like to place a copy of your proposal in the hands of every interested manufacturer in this country."

Steel and Wrought Iron Pipe Nipples. Announcements have been issued to the industry that the Recommended Commercial Standards for Steel Pipe Nipples and Genuine Wrought Iron Pipe Nipples have been accepted by a sufficient number to warrant their publication by the Department of Commerce.

## SPECIFICATIONS

A. S. McAllister

### 15. WAR DEPARTMENT FAVORS WORK

Honorable Charles B. Robbins, the Assistant Secretary of War, in his annual report addressed to the Secretary of War, praises the work carried on by the Division of Specifications in the promulgation of the "willing-to-certify" lists. In his report, Colonel Robbins stated that his office has been cooperating with the Bureau in his plan. The list of "willing-to-certify" manufacturers, are those who are willing to certify that their products comply with the requirements of the developed specification.

In another section of his report, Colonel Robbins said, "the various branches of the War Department are progressing in the preparation of specifications for supplies. Obviously specifications unsupported by an adequate inspection system can not assure us of obtaining the most suitable article for our purpose. Inadequate inspection permits the substitution of inferior articles by unscrupulous bidders, particularly when our purchases are largely made from the lowest bidder. The bidder who intends to furnish material conforming to the specifications may be placed at a decided disadvantage."

## AMERICAN MARINE STANDARDS

A. V. Bouillon

### 16. MARINE STANDARDS NEWS

The Executive Board met last month and transacted the following principal items of business; it decided to increase each of the three existing technical committees by the addition of two Pacific Coast members. It approved for promulgation as a marine standard the final report of the Special Committee on "Stability and Loading." It approved for communication to the International Standardization Bureau certain recommendations regarding proposed international standards for "Glass for Scuttles and Lights" and for "Bollards " It approved for a study and possible development a proposition to standardize a uniform for officers of the merchant marine. It approved for promulgation standards for the following: Medical Equipment for ships and small vessels, comprising medicine chests and lists of medical and surgical supplies and equipment for three classes of vessels. Deck scupper and deck drains. Specifications for built-up propellers templates for propeller blade flanges and for solid propellers. It authorized steps to be taken toward organization of a Technical Committee on "Port Facilities " It received a report from Capitain R. D. Gatewood Vice-Chairman on "Furthering the Adoption and Use of American Marine Standards."

The Nominating Committee has proposed twenty-seven candidates for election to the Executive Board for the year 1929 This election takes place during the month of December All of the members of the present Board have been renominated.

During November the following printed publications of the American Marine Standards Committee series were distributed: AMSC #4-Rigging Screws, AMSC 35-Insulation of piping and machinery on ships - Specification; AMSC-36-Magnesia Molded Pipe covering and blocks -

Specification; AMSC-37-Magnesia Asbestos plaster - Specification; AMSC-38 Asbestos Millboard - Specification; AMSC-39 Hair felt for insulation - Specification; AMSC-40, Cotton duck for insulation coverings - Specification; AMSC-41, Metallic Packing for condenser tubes - Specification; AMSC-42, Hubs for built up propellers with flush facings and fairwater caps for same; AMSC-43, Rubber air hose - Specification; AMSC-44, Rubber steam hose specification; AMSC-45, 1-1/2 inch water hose, rubber covered - Specification; AMSC-46, 2-1/2 inch water suction hose, smooth bore - Specification; AMSC-47, Oil suction and discharge hose, rubber covered - Specification: ASMC-48, scupper valves - Sizes 3, 4, 5 and 6 inches; ASMC-49, Boom steps for 5, 10, 15, 20, and 30 ton booms.

## DOMESTIC COMMERCE

### 17. PERSONALITY

Personality counts in business, according to Joseph Tausek. In a recent article in Nation's Business, he said that it is a paradox of the times that, in this age of iron and steel, of mechanical perfection and of unprecedented economic development, industry for the first time is turning to personality as one of the prerequisites among its rank and file. It is awakening to a realization of the fact that there is no more place in the present scheme of things for the man of anaemic personality than there is for the tallow candle in this age of electric light. Contrary to popular opinion, a forceful personality does not lie in a contagious smile or a hearty slap on the back, but rather is it human character developed to the ninth degree. It is efficient self-organization, the balancing of all the parts which go to make up the human machine and their co-ordination. The mainspring of this machine is character, the parts which motivate it varying in each case with the individual concerned. And the sum of all of them is personality.

### 18. MERCHANTS ENTER NEW ERA

Because the resourcefulness and freedom of action of the individual goes far toward offsetting the advantatges of large scale operation of more complicated organizations, the independent merchant has a secure position in the present development of business, says a writer in Hardware Age, in discussing "Independent Merchants Entering New Era." Continuing, this wrter says:

"However, in this era of changing business methods, the merchant who refuses to consider the new order of things must give ground to his more efficient competitor. Among the problems of greatest interest to the independent merchant are those dealing with retail distribution and marketing. The old order of wholesaler, jobber, and retailer, has developed into a confusing system which complicates the problem of efficient business administration and gives rise to a certain amount of distrust amount the consuming public. The independent business man with reasonable capital, willing to utilize new methods and take advantage of new conditions, has a greater opportunity today than ever before."

### 19. PROFITS

Profits are a by-product of service, according to William A. McGarry. In a recent number of Forbes, Mr. McGarry has the following to say on this all important subject. "Attempting to describe the phenomenon of American prosperity in terms of the mistaken economics of the past, we can trace the cause to our reversal of the old policy under which one man's profit was another man's loss, the formula of limited use. Back of our new formula of universal use is the discovery that value lies not in material things, nor in the energy expended to attain a given end, but in the contribution made by each, whether it be a gold coin, a motor car, or a skyscraper, is merely the symbol of wealth. It is without value the

moment people cease to find it useful. That nation is richest, therefore, which can produce the largest variety of useful things and put them within the reach of the greatest proportion of its population. A business which bases its policies on this simple definition of value does not have to worry about its profits, for they are an inevitable by-product of service.

20. MORE PROFITS

In discussing "More Profits for the Retailers and the Public," before the Retailers Luncheon, of the Illinois Chamber of Commerce, Chicago, Mr. Edward A. Filene, President of William Filene's Sons Company, said, "America has passed through and out of the pioneer stage of business organization into a new era, the second Industrial Revolution, and business men are learning that to survive they must not only produce and distribute goods, but also help to produce and distribute the purchasing power with which the consumer can purchase these goods. Business can not get profits except from the consuming public. Therefore, the consuming public must be prosperous. The common sense way for retailers to increase profits is to organize in powerful associations. By this plan the independents should be able to beat out the big chains as they would have all the advantages of the chains with the additional advantage of an interested owner ship-management. By good merchandising we can contribute to prosperity, and prosperity in turn will do away with the class feeling and jealousy which lead to irresponsible radicalism and dangerous discontent."

21. GONVERMENT'S RELATION TO BUSINESS

In a speech before the American National Retail Jewelers' Association convention at Dallas, Texas, October 3, Mr. H. C. Dunn of the Department of Commerce, pointed out the importance to business of knowledge of facts whereby waste and misdirected effort may be avoided. The Bureau of Foreign and Domestic Commerce concerns itself with the promotion of American commercial interests. It serves as an unbiased clearing house of commercial information such as can be obtained in the Department, in other branches of the Government, or through reports from nongovernmental sources. Inquiries and requests for information on invididual business problems receive the benefit of existing research data, trade reports of the practice and experience in practically every phase of commerce, and the personal knowledge of the Bureau's specialists, which is constantly added to by research and field work by the Bureau's staff, in such fields as analysis of distribution costs, wholesale and retail, consumer demand, credit conditions, and industrial traffic management.

22. UNSETTLED PROBLEMS

What are the four big unsettled problems of installment selling? Edwin R. A. Seligman, Professor of Political Economy of Columbia University, discusses the subject in the Magazine of Business in the following vein of thought.

"Only as a modern business world acts in conformity with well-tested economic principles will it find the answer to the four great installment questions facing it today. The solution of the first problem, the effects of the system on business economy in the event of an industrial crisis, is largely problematical, as we have no experiences to guide us. The second question, namely, how to eliminate the abuses which are still rampant in installment selling, is finding its answer in the education of the consumer. The third question, which asks to what new lines installment selling is applicable, finds its answer in the character of the consumer and the nature of the commodity. The fourth, and by far the most significant problem, is that of the influence of the system upon the consumer himself.

"Only the business leader who is able to visualize the characteristics of the article in which he is dealing, and the particular kind of consumer to whom he is making an appeal, will be able to decide whether this new form of credit will encourage thrift or discourage effort. The future of our newly evolved system rests with the vision and the intelligence of the great captains of industry."

23. THE WEAK LINK OF PURCHASING.

"Continued development of purchasing is bound to emphasize the importance of testing as a corollary of purchase specifications" states an editorial in the Purchasing Agent "Adequate specifications indicate that the buyer knows what he wants. Adequate inspection insures that he will get what he wants. These are companion principles of purchasing, and a purchasing department not equipped for both essentials has a weak point in its organization.

"Because that weakness characterizes many industries today, the purchasing agent who seeks to increase the efficiency of his department is likely to find the greatest opportunities in the field of inspection."

24. SHOP TRAINING ADVOCATED

Cooperative part time education in which industry and the schools work together for a specific training objective is advocated by the Federal Board for Vocational Training as a desirable method of training apprentices in the skilled trades. It is claimed that by this method a boy can get his training in industry while gaining more technical and related information than he would under the old apprenticeship.

25. MANAGEMENT GROUP FORMED

The organization of an international management research group of department stores is reported in the "Daily News Record" for October 17. Several American Stores have been invited to join the new organization. The first move of the group has been the pooling of information relating to expenses incurred in running accounts, and how these and other current liabilities in a department store can be kept down to a minimum is now being investigated by the group members.

26. INDUSTRIES ARE AIDING

A committee of civilian specialists is cooperating with the War Department in the development of types of ammunition and the solution of the problems of industrial preparedness for war emergency, according to the annual report of Major General C. C Williams, Chief of the Army Ordnance Department.

27. WHERE CO-OPERATION SHOULD START

In his article, "Where Co-Operation Should Start," which appeared in Hardware Age, L. S. Soule, says that "the solving of the new competition problems hinges on active thoughtful, practical co-operation, a co-operation, moreover, which not only includes the manufacturer, jobber and retailer, but is broad enough to take in the traveling salesman and the man behind the counter, be he salesman or clerk. In addition, real cooperation demands that the cards be placed face up on the table, that confidences be exchanged, that there is created a mutual desire to work together. One of the first logical steps in any attempt to profitable meet competition is the dissemination of real facts, merchandising facts, among the men in the organization. Six months of properly conducted store meetings, leading to the development of real co-operation within the store would do more to build up profits and

prestige than any number of special sales or cut prices. Co-operation is a great thing, but like charity, it should begin at home."

28. COOPERATIVE BUSINESS

The Department of Agriculture reports business to the amount of $2,300,000,000 done in the 1927 market season by 11,400 farmers' cooperative associations with a membership of about 3,000,000 including shareholders, shippers, consigners and patrons. While the future is less by $100,000,000 than the total business of the 10,803 associations with less than 2,700,000 members listed in 1925, the lower price level in 1927 more than accounts for the difference.

Grain marketing associations led in volume of business and number of methods followed by dairy products, livestock, fruit and vegetables, and cotton marketing associations. Next in volume of business come poultry and egg, nut, tobacco, and wool marketing associations. Nearly $200,000,000 worth of business was done by associations selling miscellaneous products and buying farm supplies. Since 1915 the associations handling dairy products and shipping livestock have increased enormously, while those handling grain and fruits and vegetables have gained about one hundred per cent and fifty per cent respectively. The West North Central States led in cooperative activity as they did in 1915 and 1925. California associations reported a larger amount of business than those of any other state, but Minnesota, Iowa, and Illinois, led in number of members of cooperative associations.

29. NEW ENGLAND MANUFACTURES

A comprehensive statistical survey of New England manufactures is contained in "New England Manufactures in the Nation's Commerce," Trade Information Bulletin No. 582, recently issued by the Bureau of Foreign and Domestic Commerce, Department of Commerce. Comparisons of New England wages, production, contributions of individual industries to the nation's total, pre-war period and post-war period manufacturing activity and statistics arranged according to states, counties, and cities are succinctly set forth. The diversity and broad range are also illustrated. Of its lines of manufacture 217 were of sufficient size to be included in the census tabulations for 1925, these comprising nearly two thirds of the 348 separate classifications for the whole United States.

30. NEED BALANCED STOCK

The disadvantage of placing too much emphasis on stock cutting in order to get increased turnover without reference to the record of individual items is pointed out in the Bureau's recently issued pamphlet, "Retail Profits Through Stock Control," the third of its Distribution Cost Studies. Not only do increased operating costs result from items reported "short" with added costs due to telegrams, parcelpost and express charges, which often wipe out the entire profit on a particular transaction, but prestige and good will are lost by inability to fill orders for staple merchandise on short notice. Not only the retailer suffers, but the manufacturer by receiving an unwarranted number of small and unprofitable orders. The installation of an itemized stock control system resulted in one case in a decrease within three years of 50 per cent in the number of "shorts" reported.

31. DISTRIBUTION COSTS

"Distribution costs in New Zealand and elsewhere have outgrown their economic justification, and new methods developing from competitive pressure are arising to meet the altered requirements of the times," states the 11th Annual Report of the Department of Industries and Commerce, 1928. "As chain stores and department stores become an increasing feature in the

his present system he can not secure an adequate return for his commodity, it behooves him to call to his aid the engineers, and the men of science, who are, in a measure, responsible for his sad condition. The coal mine owner is the keyman in the industrial fabric. If by some turn of fate all the coal mines of the world should be shut down, our civilization would tumble about our ears. Life itself would be well-nigh impossible, and yet the coal producer is the creature of economic accidents which he can control only in a small degree."

38. VALUE OF RESEARCH

The Division of Engineering and Industrial Research of the National Research Council recently conducted a survey in which 797 of the 800 replies received from manufacturers indicate their belief that research pays. In addition to research by Government bureaus, educational institutions, trade associations, and special groups in an industry cooperating on a definite research job, 68 per cent of these manufacturers maintain private laboratories. Over one-third of these are working to improve the quality of products and service to customers, on the assumption that reduced production costs will follow, 25 per cent of them toward the development of new fields of application; and 15 per cent to discover by-products and new materials.

According to the report of this survey in "Factory and Industrial Management" returns from leading manufacturers indicate that, excluding the automobile industry, on which figures are incomplete, the highest average annual research expenditures are $105,000, in the chemical and allied products industry, followed by $100,000 in the rubber and rubber products industry. The average research expenditures in percentage of capital invested are 2.4 for the chemicals and allied products industry, with metal working plants holding second place with 2.1. Research expenditures by metal working plants showed an increase of 200 per cent for 1927 over 1926, while a 100 per cent increase was reported for the paper and pulp, rubber and rubber products and textile industries.

39. TIRE WEARING QUALITIES

The results of research on the wear, particularly non-uniform wear, of tires are presented in Research Paper No. 2, recently released by the Bureau of Standards. The results indicate that the center of a tire slips in one way and the outer edges in another, and that the wear is definitely influenced by the tire design. Further study of tire treads by this means is expected to yield valuable information as to how wear can be reduced.

40. RESEARCH PAYS

In a recent issue of Manufacturing Industries, L. P. Alford, Editor of that publication, says that $50,000,000 spent by American Manufacturers each year in industrial research is producing discoveries estimated to be worth one-half billion dollars. This ten to one (10-to-1) return shows the practical utility of organized study and experiment.

41. INDUSTRY AND AGRICULTURE COOPERATE

In discussing "Industry and Agriculture in Real Cooperation" in American Industries John C. Gall, Assistant to the General Counsel of the National Association of Manufacturers makes the following observation:

Realizing that mass production and distribution are essential to the satisfaction of the material needs of a market such as ours, and that mass production is possible only when the purchasing power of the consumer is adequate, American manufacturers are vitally interested in a prosperous agricultural population. We have long known that there is no single straight

and narrow road to prosperity, profits come as inevitably from reducing costs of production as from increasing the price of the product. The research laboratory has been the constant ally of the industrial producer. Through application of the same methods to agricultural production, enormous benefits will accruce both to the agricultural community and the balance of the consuming public. Cooperative industrial agricultural ventures are being initiated and ought to result in better returns to agricultural and better customers for industry."

42. STUDY OF CORONA VOLTMETER

A thorough study of the corona voltmeter, used for measuring very high voltages, is described in a new research paper of the Bureau of Standards.

## UTILIZATION OF WASTE

43. ADVANTAGES OF KNOTTY LUMBER

Experiments at the United States Forest Products Laboratory prove that knotty lumber will make a box with short, thick sides more resistant to rough handling than clear lumber provided the boards have a slenderness ratio - length divided by thickness - less than 60. The laboratory's tests developed that clear boards are not flexible enough when subjected to rough handling to absorb the shocks produced by the box contents and relieve the direct pull on the nails. It is recommended that the size of any one knot in a board used for this purpose should not exceed one-third the width of the board, and that the aggregate diameter of all knots within a length equal to the width of a board should not exceed the diameter of the largest knot allowable. Other advantages from the use of knotty lumber in boxes are its lower cost as compared to clear lumber and the fact that its use provides an outlet for low grade lumber, thus resulting in more complete wood utilization.

44. MANUFACTURE OF WALLBOARD

The "Iowa Homestead" for October 11, states that a factory at Dubuque is reported equipped for the manufacture of wall board from cornstalks, and is expected to begin operations on a considerable scale this fall. A paper mill at Danville, Illinois, is reported to be ready to manufacture paper from cornstalks the practicability of which is claimed to have been demonstrated by the Chemical Engineering Department of Iowa State College.

45. COTTON BY-PRODUCTS

A saving of $256,027,431 in one year from the diversion of 5,558,243 tons of cottonseed from the refuse pile into channels of consumption is credited to chemical research. Of the four primary elements into which seeds today are separated, a crude oil, a cake or meal, linters, and hulls, only hulls may now be regarded as waste. Chemistry devised means for refining the oil, for converting it into fats or tallows, and for separating its various components and converting each of them into new and useful articles. The improved cotton seed cake because of its nitrogen content is in great demand as a fertilizer and because of its high protein content and freedom from fiber is a valuable concentrated cattle feed. Processes have been discovered by which it may be refined and made desirable for human consumption also. Chemistry also has created a market for linteres, which less than two decades ago found use only as batting and mattress filling. The cellulose, which constitutes about 85 per cent of the composition of linters, is now transformed into such commodities as high explosives, surgical dressings, and "new skin", artificial leather and sausage casings, roofing and floor coverings, wearing apparel, lacquers, varnishes, photographic films, toilet articles and billiard balls. Even the hull contains desirable chemical substances, such as furfural, acetic acid, alcohol, tar and other hydrocarbons, as well as potassium and compounds of carbon and sodium, but these await the discovery of economical methods of recovery.

46. STUDIED INDUSTRIES

The National Institute of Industrial Psychology, London, England, incorporated in 1921 has studied the human side of labor and has put the results of such studies into practice in one hundred industrial organizations. Among the lines of investigation which have yielded valuable results to both employers and employees are reduction of waste, arrangement of materials and design of implements, layout of plant, and effects of illumination, ventilation, etc., on efficiency.

47. "WASTE WEEK" RESULTS IN SAVING

"Waste Prevention in Manufacturing Plants," an account of an industrial survey conducted by the Ahrens Publishing Company, reports the results of a "Waste Week" conducted by a shipbuilding and dry dock company employing 5,300 workers. Suggestions received from employees, when carefully evaluated, showed potential savings to the company of $250,000 a year. Out of 1,482, concrete ideas considered 677 were approved and the employees making them substantially rewarded. The 232 suggestions already put into effect represent an annual saving of $80,455. It is estimated that savings of $6,000,000 to American industry have resulted from waste prevention programs since the "Waste in Industry" report was published in 1922.

48. PRODUCTION ECONOMIES

An article in "Management" reports the experience of a speedometer manufacturing company with automatic conveyor belts in their assembly department. A 50 per cent cut in production costs is claimed and much floor space has been released by the conveyor belt obviating the use of trucks. Their first conveyor system was installed experimentally but such worthwhile savings in time and labor resulted that additional systems have been installed and still further mechanical handling methods are contemplated.

## ELIMINATION OF WASTE

49. ECONOMY IN OFFICE SUPPLIES

A nationally known insurance company has developed a successful method for economically controlling the handling of the office supplies required by its large number of employees. The company is organized in sections, in each of which there is designated a stock clerk whose responsibility is to assemble the requirements for the individual employees in the section, compile them and issue a requisition on the central supply bureau which is charged with the responsibility for originating and specifying the quantities and items to be purchased through the purchasing department. A quarterly statement prepared by this bureau is furnished to each section head. This statement shows the average cost of supplies per clerk for both the company as a whole and for the individual sections. The statements are prepared in terms of total value rather than units of supplies issued. A definite policy of buying according to standard specifications has been adopted and a continuous effort is made to reduce the number of items carried in sotck to a minimum. For example, only three kinds of pencils are carried in stock. Re-packaging small items of supply, such as clips and rubber bands into containers for individual clerks has also been found an effective measure of economy, as it reduces the tendency to order in large quantities.

50. PROPER USE OF WOOD

The National Committee on Wood Utilization, Department of Commerce, had an exhibit at the Ideal Home Exposition held in Washington, showing the proper use of wood in home construction. Recommendations ranged from framing lumber to rayon and from shingles to paints made from wood chemicals. Recommended features of contruction for economy in cost and

materials, and for the more artistic use of wood and forest products in home decoration, were brought out by models, diagrams, photographs, panels and other exhibit materials.

The use of end-matched and short-length lumber for strong construction and economic utilization of material was stressed and the desirability of grade marked lumber to enable purchasers to check up on quality. The advantages were emphasized of using properly seasoned lumber in home construction. The use of flooring lumber treated to resist moisture was demonstrated. Material furnished by the Department of Agriculture, showing how wood-boring worms and insects destroy the wood, was exhibited to bring out the economy of using lumber chemically treated to resist attack of insects and decay.

Methods were shown of insulating houses with materials made from sawdust, wood flour and other wood waste, to retain heat in winter and keep it out in summer. Possible economies were pointed out from the use of stained, though strong and useful lumber for interior trim to be covered with paint or enamel. How to use interior molding trim of wood flour composition pressed to shape by machinery was also demonstrated.

Rayon and other artificial silks made from material directly derived from wood were shown in hangings and curtains, and artistic and preservative paints made from chemicals extracted from wood were exhibited.

## NEW PUBLICATIONS

### 51. FOREIGN LANGUAGE EDITIONS

Manufacturers and exporters of metal products will find that the recently revised Spanish language edition of the Industrial Standards Series of the Bureau of Foreign and Domestic Commerce offer opportunities for much greater ease in communication with consumers in Spanish speaking countries. These are Standard Specificiations of the American Society for Testing Materials as amended in 1927 and 1928, and are extensively used throughout the United States. The revised standards in this series include Industrial Standards Nos. 10, 11, 12, 13, 14, 20, 62 and 63, whioh specify standards for carbon steel bars for railway springs, carbon steel and alloy steel forgings; quenched and tempered carbon steel axles, shafts, and other forgings for locomotives and cars, carbon steel forgings for locomotives; carbon steel car and tender axles; welded steel pipe; quenched and tempered alloy steel axles, shafts and other forgings for locomotives and cars; and lap welded and seamless steel and lamp welded iron boiler tubes. One new industrial Standard No. 65, zinc coated (galvanized) sheets, was added to the series. Copies may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents a copy. By a cooperative arrangement with the Bureau of Foreign and Domestic Commerce, industries desiring it may have their commercial standards translated into foreign languages such as Spanish, Portugese or French, and printed copies of the translation will be distributed through the Foreign Trade Representatives of the United States in an effort to extend foreign trade in the commodity. It is believed that such translations of commercial standards will prove of material benefit in the development of foreign markets, particularly since they will enable the foreign buyer to purchase with greater confidence and assurance, or, if desired, he may make the Commercial Standard a part of the sales contract to insure delivery of satisfactory material.

### 52. THE DEPARTMENT OF COMMERCE

A 63 page pamphlet issued November 1 under the above title contains an exposition of the organization of the Department of Commerce and a brief description of the activities of each of the bureaus comprising it. A map prepared by the Aeronautical Branch showing the status of the various airways in the United States as of June 30, 1928, indicates graphically the

progress that has been made in aeronautical transportation. Another map indicates the extent of the contacts made by the Bureau of Foreign and Domestic Commerc, showing, as it does, the location of the numerous field offices, both foreign and domestic, of this Bureau. Photographs illustrative of the activities of other Bureaus, offices and services of the Commerce Department are contained in this pamphlet which clearly sets forth the numerous and varied activities concerned with the promotion of the nation's industry and trade which have continuously increased in value to the nation since the establishment of the department by the organic act of 1903.

53. FOR ARCHITECTS AND BUILDERS.

A new publication of great value to architects and builders is promised in the forthcoming January issue of the Bureau of Standards Journal of Research. Under the title "Fire Resistance of Hollow Load-bearing Wall Tile" it reports the results of three extensive series of fire tests of wall construction of hollow load-bearing tile of representative designs and clay materials. The scope and purpose of these tests make the paper one which every architect and builder should possess. Copies are expected to be off press early in January. The paper contains 334 pages and 187 illustrations which indicates the extraordinary scope of the publication. The Journal of Research is issued monthly at 25 cents the copy or $2.75 for the year's subscription. Copies should be ordered from the Superintendent of Documents. Government Printing Office, Washington, D. C.

54. NEW PUBLICATIONS OF BUREAU OF STANDARDS. Additions to Supplementary Lists of Publications of the Bureau of Standards. (Beginning July 1. 1928).

Bureau of Standards Journal of Research, August 1928, Vol. 1, No. 2, RP Nos. 6 to 10, inclusive, Price 25 cents, Foreign 31 cents. RP1. Accelerated tests of organic protective coatings; P. H. Walker and E. F. Hickson. Price 5 cents. RP2. Measurement of the Tread Movement of pneumatic tires and a discussion of the probable relation to tread wear; W. L. Holt and C. M. Cooke. Price 5 cents. RP3. Absolute methods in reflectometry: H. J. McNicholas. Price 10 cents. RP4. Interferometer measurements of wave lengths in the vacuum arc spectra of titanium and other elements; C. C. Kiess, Price 5 cents. RP5. Anaylsis of bauxite and of refractories of high alumina content; G. E. F. Lundell and J. I. Hoffman. Price 5 cents. RP6. Some measurements of the transmission of ultra violet radiation through various kinds of fabrios; W. W. Coblentz, R. Stair, and C. W. Schoffstall. Price 5 cents. RP7. Tinting strength of pigments; H. D. Bruce, Price 10 cents. RP8. Wave length measurements in the arc and spark spectra of hafnium; W. F. Meggers. Price 15 cents. RP9. Tests of the effect of brackets in reinforced concrete rigid frames; F. E. Rickart. Price 25 cents. RP10. Aocelerated laboratory corrosion test methods for zino coated steel; E. C. Groesbeck and W. A. Tucker. Price 35 cents.

Bureau of Standards Journal of Research. Vol. 1, No. 5, November 1928. (RP Nos. 24 to 31, Inclusive.) Price 25 cents, Foreign 31 Cents. RP24. Mutual inductance and torgue between two concentric solenoids; Chester Snow. Price 5 cents. RP25. A study of the hydrogen-antimony-tin method for the determination of oxygen in cast irons; Bengt Kjerrman and Louis Jordan. Price 5 cents. RP26. Note on the effect of repeated stresses on the magnetic properties of steel; M. F. Fischer. Price 5 cents. RP27. Effect of twist on cotton yarns; A. A. Mercier and C. W. Schoffstall. Price, 5 cents. RP28. Design of tuned reed course indicators for aircraft radiobeacon; F. W. Dunmore. Price 5 cents. RP29. Thermal expansion of magnesium and some of its alloys; Peter Hidnert and W. T. Sweeney. Price 10 cents. RP30. Equipment for routine spectral transmission and reflection measurements; H. J. McNicholas. Price 20 cents. RP31. Effect of temperature change on the color of red and yellow lovibond glasses; Deane B. Judd. Price 5 cents.

Simplified Practice Recommendations. R84-28 Composition books. Price 5 cents. SPR3-28 (2nd Ed.) Metal lath. Price 5 cents. SPR4-28 (2nd Ed.) Roofing slate. Price 5 cents. SPR20-28 (2nd Ed.) Steel Barrels and drums. Price 5 cents. SPR37-28 (2nd Ed.) Commercial forms, (Invoice, inquiry, and purchase order.) Price 5 cents. SPR43-29 (1st rev.) Paint and varnish brushes. Price 5 cents. SPR51-29 (2nd Ed.) Die head chasers (for self opening and adjustable die heads) Price 5 cents. SPR80-28 Folding and Portable wooden chairs. Price 5 cents. SPR86-28 Surgical gauze. Price 5 cents.

Commercial Standards. C81-28 Clinical Thermometer. Price 5 cents.

Building and Housing. BH12 Present Home Financing Methods. (Preliminary edition) Price 5 cents. BH11. Standard City Planning Enabling Act. Price 15 cents.

Miscellaneous Publications. M88 Annual report of director of the Bureau of Standards for fiscal year ended June 30, 1928. Price 5 cents.

55. APPENDIX

Simplified Invoice League

| Company | Period | Invoices Checked | On Simplified Form | Per Cent Adherence |
|---|---|---|---|---|
| Pennsylvania Railroad Company, | Regularly | --- | --- | 100.00 |
| Humble Oil and Refining Co. | 1 week | 2414 | 2159 | 89.53 |
| Grand Rapids, R. R. Company, | --- | --- | --- | 65.00 |
| Westinghouse Electric & Mfgr. Co. | --- | --- | --- | 60.00* |
| Mid-Continent Petroleum Corp. | 1 week | 548 | --- | 45.00 |
| Buick Motor Company | 15 days | --- | --- | 34.00 |
| Barber Greene Company, | 13 days | 545 | 165 | 30.28 |
| American Beet Sugar Company | --- | --- | --- | 30.00* |
| Philadelphia Rapid Transit Co. | --- | --- | --- | 30.00* |
| West Penn Power Company | 15 days | 446 | 131 | 29.37 |
| Tidal Companies, | 10 days | --- | --- | 27.76 |
| Monongahela West Penn Public Service Co. | 10 days | 1464 | 281 | 19 19 |
| Virginia Electric & Power Company | 15 days | 1111 | 212 | 19.08 |
| Dodge Electric Company, | 2 weeks | --- | --- | 17.75 |
| Capital Traction Company, | 15 days | 165 | 29 | 17.58 |
| Yale and Towne Mfg. Company | --- | --- | --- | 16.00 |
| Lone Star Gas Company, | 1 week | 530 | 83 | 15.66 |
| Public Service Coordinated Transport, | 17 days | 1774 | 277 | 15.61 |
| Star Machinery Company | 1 month | 187 | 29 | 15.50 |
| Indianapolis Street Ry. Company | 20 days | --- | --- | 15.00 |
| Refinery Supply Company | 6 days | 96 | 14 | 14.59 |
| Potomac Edison Company | --- | 2000 | 289 | 14.45 |
| Oklahoma Railway Company | --- | --- | --- | 13.00 |
| The Chandler Company | 10 days | 40 | 4 | 10.00 |
| Cincinnati Street Ry. Company | 10 days | 761 | 74 | 9.72 |
| Barnsdall Oil Company, | 12 days | --- | --- | 7.80 |
| Philadelphia Company | --- | --- | --- | 5.00* |
| Kewanee Oil and Gas Company | 1 month | 485 | --- | 3 33 |
| University of Colorado | 1 month | --- | --- | 2 90 |
| H. F. Wilcox Oil & Gas Company | --- | 393 | --- | 1.10 |

pproximate*